

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 18-23, 26 and 28-32 are pending in the application, with claims 1 and 26 being the independent claims. Claims 1-17, 24, 25 and 27 are sought to be cancelled without prejudice to or disclaimer of the subject matter therein. New claims 28-32 are sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Support for the amendments to the claims are found throughout the specification and in the originally filed claims. For example, support for the amendments to claim 18 is found at page 9, paragraphs 47-49, original claim 24 and pages 5 and 6, paragraphs 28 and 29. Support for the amendment to claims 19-20 is found at page 7, paragraph 38. Support for the amendment to claim 22 is found at original claim 17. Support for the amendment to claim 23 is found at original claim 14. Support for the amendment to claim 26 is found at original claim 25. Support for new claim 28 is found at original claim 20. Support for new claim 29 is found at original claim 8. Support for new claim 30 is found at original claim 9. Support for original claim 31 is found at original claim 11. Support for new claim 32 is found at original claim 13.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Objections to the Drawings

The objection to the drawings under 37 CFR § 1.83(a) is respectfully traversed.

The Office has stated that the drawings must show every feature of the invention specified in the claims. OA at page 2. In particular, the Office states that the illuminator and pupil of claim 26 must be shown or the feature(s) canceled from the claim(s). *Id.*

Applicant submits that these features are shown. Figure 3 of the present application is a schematic representation of a lithographic system that includes a polarizer according to an embodiment of the present invention. An embodiment of an illuminator and pupil are illustrated in Figure 3 by the rectangular boxes (310) and (330) titled "Light Source" and "Optics," respectively. Further, the rectangular boxes (310) and (330) are explicitly described in the specification at paragraph [0049] making it clear that an illuminator and pupil are shown in the drawings in accordance with 37 CFR § 1.83(a). Withdrawal of this objection is therefore respectfully requested.

Rejections under 35 U.S.C. § 112, second paragraph

The rejection of claims 12-16 under 35 USC § 112, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is respectfully traversed. Claims 12-16 have been canceled, rendering this rejection moot. Reconsideration and withdrawal of this rejection are therefore respectfully requested.

Rejections under 35 U.S.C. § 102

The rejection of claims 1, 7, 11, 17, 18, 22 and 23 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication No. 2002/0191185 to Rotter *et al.* ("Rotter") is respectfully traversed.

Claims 1, 7, 11 and 17 have been canceled, rendering this rejection moot with respect to these claims. Amended claim 18 is directed to a lithography apparatus comprising, *inter alia*, a source producing a light beam having at least one wavelength within the UV spectrum; a mask; a substrate transparent to light in the UV spectrum and disposed in a path of the light beam; and an array of wire elements on the substrate; wherein the array of elements are radially arranged in a circular pattern around the optical axis of the polarizer and divided into groups of parallel elements to polarize incident UV light and output tangentially polarized light, with respect to the cylindrical symmetry of the polarizer, toward the mask. Claims 22 and 23 depend from claim 18 and therefore incorporate the limitations of claim 18. Rotter does not teach, either explicitly or inherently, each and every element of the present application. For example, at the very least Rotter does not teach a lithography apparatus that includes an array of elements radially arranged in a circular pattern around the optical axis of the polarizer to polarize incident UV light and output tangentially polarized light as recited in claim 18 and therefore does not anticipate the claims of the present invention. Rotter is directed to an optical measurement system that includes a spectroscopic ellipsometer for evaluating the characteristics of a specimen. *See*, for example, claim 1 of Rotter. Accordingly, withdrawal of this rejection is respectfully requested.

The cancellation of claims and any amendments to existing claims should not be taken as acquiescence to the Office's rejection and have been done solely to expedite prosecution.

Rejections under 35 U.S.C. § 103

The rejection of claims 2-6, 8-10, 19-21 and 24-27 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent Appl. No. 2002/0176166 ("Shuster") in view of U.S. Patent Appl. No. 2002/0191185 ("Rotter") and in further view of German Patent No. 19621512 ("Hubner") is respectfully traversed. Claims 2-6, 8-10, 24, 25 and 27 have been canceled rendering this rejection moot with respect to these claims.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference, or references when combined, must teach or suggest all the claim limitations. MPEP § 2143. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *Id.* Last, there must be a reasonable expectation of success of practicing all of the claim limitations. *Id.*

Shuster, Rotter, and Hubner do not teach or suggest, either individually or in combination, a lithography apparatus comprising a source producing a light beam having at least one wavelength within the UV spectrum, a mask, a substrate transparent to light in the UV spectrum and disposed in a path of the light beam, and an array of wire elements on the substrate, wherein the array of elements are radially configured to polarize incident UV light and output tangentially polarized light as now recited in independent claim 18.

Shuster does not teach or suggest a polarizer having an array of wire elements patterned that polarize UV light. OA at p. 5. Shuster teaches a polarizer for transforming a light beam incident along an optical axis into an exiting light beam that has a prescribed distribution of locally varying polarization states over its cross section. Shuster at paragraph [0012]. In particular, Shuster teaches that the illuminated cross-section of the polarizer is subdivided into numerous zones wherein, *inter alia*, the axial thickness of the zone and the inclination angle are adapted such that a difference in the optical path lengths of the field components within the zone corresponds to a prescribed relative retardation upon exiting the polarizer and the orientation of the transmission plane of every such zone is prealigned such that the desired, local, preferred polarization directions exist within that zone. Shuster at paragraphs [0012] - [0016]. Shuster also teaches a polarizer on whose entrance and exit faces have deflecting structures, which can be in the form of hexagonal zones that can act in similar fashion to a diffraction grating, where the orientation of the latter's paralleled ruled lines differ from zone to zone. Shuster at paragraph [0041]. Shuster therefore does not teach a lithography apparatus comprising, *inter alia*, a source producing a light beam having at least one wavelength within the UV spectrum; a mask; a substrate transparent to light in the UV spectrum and disposed in a path of the light beam; and an array of wire elements on the substrate; wherein the array of elements are radially arranged in a circular pattern around the optical axis of the polarizer and divided into groups of parallel elements to polarize incident UV light and output tangentially polarized light, with respect to the cylindrical symmetry of the polarizer, toward the mask as recited in claim 18.

Rotter does not cure the deficiencies of Shuster. Specifically, Rotter does not teach or suggest, either explicitly or inherently, comprising a source producing a light

beam having at least one wavelength within the UV spectrum, a mask, a substrate transparent to light in the UV spectrum and disposed in a path of the light beam, and an array of wire elements on the substrate, wherein the array of elements are radially configured to polarize incident UV light and output tangentially polarized light. In contrast, Rotter is directed to an optical measurement system, not a lithography apparatus. Rotter's system comprises a spectroscopic ellipsometer for determining the change in polarization state of a probe beam after interaction from the specimen. Rotter at paragraph [0003]. A beam with a known polarization state is focused on a sample and the change in polarization state after interaction with the sample is measured to determine characteristics of the sample. Rotter at paragraph [0012]. Rotter therefore relates to systems and methodologies for mitigating errors induced in a focused beam spectroscopic ellipsometer employed in the evaluation of samples such as semiconductor devices. Rotter at paragraph [0019]. Accordingly, Rotter does not teach a lithography apparatus comprising a substrate comprising elements patterned to produce tangential polarization from incoming UV light.

Hubner does not cure the deficiencies of Shuster or Rotter. Hubner does not teach or suggest, either explicitly or inherently, a source producing a light beam having at least one wavelength within the UV spectrum, a mask, a substrate transparent to light in the UV spectrum and disposed in a path of the light beam, and an array of wire elements on the substrate, wherein the array of elements are radially configured to polarize incident UV light and output tangentially polarized light. In contrast, Hubner teaches a method of analyzing the wavelength-dependent polarization state of radiation. Hubner at column 1. For example, Hubner describes an apparatus comprising a polarization grating, a spectral deflection grating and a CCD camera. Hubner at column

2. Thus, Hubner describes analyzing the polarization state of light as a function of wavelength by influencing the polarization of the beam and spectral beam splitting such that wavelength-dependent projection on different surface areas of the detector are performed through diffractive deflection of the radiation. *Id.* Further, Hubner does not teach a pattern of radially configured elements on a UV-transparent substrate to produce tangentially polarized radiation. The pattern of Figure 10 of Hubner, for example, would not produce tangentially polarized radiation because the pitch of the elements varies along the length of the line. For example, in the center of the pattern the lines are spaced closer together than they are spaced along the outer edge.

Therefore, none of Shuster, Rotter and Hubner teaches, either alone or in combination, the apparatus of the present invention.

Moreover, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify either of the references or to combine the reference teachings. There is no suggestion or motivation in either Shuster, Rotter or Hubner to combine these references to arrive at the claimed invention. While Shuster describes a lithography apparatus, the polarizer described in Shuster does not comprise a substrate transparent to light in the UV spectrum and disposed in a path of the light beam and an array of wire elements on the substrate wherein the array of elements are radially configured to polarize incident UV light and output tangentially polarized light. Both Rotter and Hubner describe measurement and analytical systems. Both references are completely silent on lithography apparatuses.

Accordingly, there would be no motivation to combine the teaches of either Rotter or Hubner together or with Shuster because the requirements for lithography are

different than the requirements for the analytical systems described in Rotter and Hubner. Lithography requires that an image be produced at the wafer. Such imaging requires the interference of beams at the wafer to create contrast. At the very least, one of skill in the art would not be motivated to combine the teachings of Rotter or Hubner with Shuster because both Rotter and Hubner teach analytical devices that do not teach or suggest advantages of polarization patterns with respect to lithography.

With respect to claim 26, Applicants submit that the Office at the very least has not set forth a proper *prima facie* rejection as one skilled in the art would not have been motivated to combine Shuster, Rotter or Hubner for the reasons noted above. Further, neither Shuster, Rotter or Hubner above recite a lithographic apparatus for providing an exposure beam that includes, *inter alia*, a polarizer with an array of elements that polarize UV light and produce radially polarized light as recited in claim 26.

For all the foregoing reasons, withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

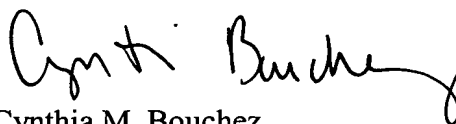
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

Sterne, Kessler, Goldstein & Fox P.L.L.C.

A handwritten signature in black ink, appearing to read "Cynthia M. Bouchez". The signature is fluid and cursive, with the first name "Cynthia" and last name "Bouchez" clearly distinguishable.

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